CERTIFICATION

SDG No:	1701428C	Laboratory:	Eurofins, Folson, CA
Site:	BMSMC	Matrix:	Air

SUMMARY: Air samples (Table 1) were collected on the BMSMC facility. The BMSMC facility is located in Humacao, PR. Samples were taken January 21, 23, 24 and 26, 2017 and were analyzed in Eurofins Laboratory of Folson, California that reported the data under SDG No.: 1701428C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample summary form shows analyte results that were qualified.

In summary, the results are valid and can be used for decision making purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
1701428C-01A	B30IA-1-012117	Air	Methanol
1701428C-02A	B30IA-2-012117	Air	Methanol
1701428C-03A	B30IA-3-012117	Air	Methanol
1701428C-04A	B30IA-4-012117	Air	Methanol
1701428C-05A	B30IA-4D-012117	Air	Methanol
1701428C-06A	B30IA-5-012117	Air	Methanol
1701428C-07A	B1830AA-012117	Air	Methanol
1701428C-08A	B18IA-1-012117	Air	Methanol
1701428C-09A	B18IA-1D-012117	Air	Methanol
1701428C-10A	B18IA-2-012117	Air	Methanol
1701428C-11A	B18IA-3-012117	Air	Methanol
1701428C-12A	B18IA-4-012117	Air	Methanol
1701428C-13A	B8IA-2-012317	Air	Methanol
1701428C-14A	B8IA-2D-012317	Air	Methanol
1701428C-15A	B8AA-012317	Air	Methanol
1701428C-16A	B8SS-2-012417	Air	Methanol
1701428C-17A	B8SS-2D-012417	Air	Methanol
1701428C-18A	B18SS-1-012617	Air	Methanol
1701428C-19A	B18SS-1Dup-012617	Air	Methanol

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:

Date: March 18, 2017

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Client Sample ID: B30IA-1-012117

Lab ID#: 1701428C-01A

EPA METHOD TO-15 GC/MS

File Name:	**j020705**	**Date of Collection:**	**1/21/17 6:17:00 PM**
Dil. Factor:	**1.61**	**Date of Analysis:**	**2/7/17 01:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	80	Not Detected	100	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: B30IA-2-012117

Lab ID#: 1701428C-02A

EPA METHOD TO-15 GC/MS

File Name:	**j020706**	**Date of Collection: 1/21/17 6:20:00 PM**	
Dil. Factor:	**1.64**	**Date of Analysis: 2/7/17 01:39 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	82	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: B30IA-3-012117

Lab ID#: 1701428C-03A

EPA METHOD TO-15 GC/MS

File Name:	**j020707**	**Date of Collection: 1/21/17 6:21:00 PM**	
Dil. Factor:	**1.91**	**Date of Analysis: 2/7/17 02:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	96	Not Detected	120	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: B30IA-4-012117

Lab ID#: 1701428C-04A

EPA METHOD TO-15 GC/MS

File Name:	**j020708**	**Date of Collection: 1/21/17 6:22:00 PM**	
Dil. Factor:	**1.61**	**Date of Analysis: 2/7/17 02:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	80	Not Detected	100	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: B301A-4D-012117

Lab ID#: 1701428C-05A

EPA METHOD TO-15 GC/MS

File Name:	**j020709**	**Date of Collection: 1/21/17 6:22:00 PM**	
Dil. Factor:	**1.68**	**Date of Analysis: 2/7/17 02:49 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	84	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: B30IA-5-012117

Lab ID#: 1701428C-06A

EPA METHOD TO-15 GC/MS

File Name:	**j020710**	**Date of Collection: 1/21/17 6:25:00 PM**	
Dil. Factor:	**1.64**	**Date of Analysis: 2/7/17 03:12 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	82	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	98	70-130

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Manuel Infante Méndez
1888
QUÍMICO LICENCIADO

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Client Sample ID: B1830AA-012117

Lab ID#: 1701428C-07A

EPA METHOD TO-15 GC/MS

File Name:	**j020711**	**Date of Collection: 1/21/17 6:42:00 PM**	
Dil. Factor:	**1.64**	**Date of Analysis: 2/7/17 03:36 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	82	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: B18IA-1-012117

Lab ID#: 1701428C-08A

EPA METHOD TO-15 GC/MS

File Name:	**j020712**	**Date of Collection: 1/21/17 6:07:00 PM**	
Dil. Factor:	**1.79**	**Date of Analysis: 2/7/17 03:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	90	Not Detected	120	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: B18IA-1D-012117

Lab ID#: 1701428C-09A

EPA METHOD TO-15 GC/MS

File Name:	**j020713**	**Date of Collection: 1/21/17 6:07:00 PM**	
Dil. Factor:	**1.68**	**Date of Analysis: 2/7/17 04:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	84	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: B18IA-2-012117

Lab ID#: 1701428C-10A

EPA METHOD TO-15 GC/MS

File Name:	**j020714**	**Date of Collection: 1/21/17 6:00:00 PM**	
Dil. Factor:	**1.75**	**Date of Analysis: 2/7/17 04:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	88	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: B18IA-3-012117

Lab ID#: 1701428C-11A

EPA METHOD TO-15 GC/MS

File Name:	**j020715**	**Date of Collection: 1/21/17 6:10:00 PM**	
Dil. Factor:	**1.58**	**Date of Analysis: 2/7/17 07:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	79	Not Detected	100	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: B18IA-4-012117

Lab ID#: 1701428C-12A

EPA METHOD TO-15 GC/MS

File Name:	**j020716**	**Date of Collection: 1/21/17 6:12:00 PM**	
Dil. Factor:	**1.41**	**Date of Analysis: 2/7/17 08:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	70	Not Detected	92	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

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Rafael Infante Méndez
Lic. # 1888
QUÍMICO LICENCIADO

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Client Sample ID: B8IA-2-012317

Lab ID#: 1701428C-13A

EPA METHOD TO-15 GC/MS

File Name:	**j020717**	**Date of Collection: 1/23/17 12:23:00 PM**	
Dil. Factor:	**1.75**	**Date of Analysis: 2/7/17 08:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	88	Not Detected	110	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: B8IA-2D-012317

Lab ID#: 1701428C-14A

EPA METHOD TO-15 GC/MS

File Name:	**j020718**	**Date of Collection:**	**1/23/17 12:23:00 PM**
Dil. Factor:	**1.87**	**Date of Analysis:**	**2/7/17 08:46 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	94	Not Detected	120	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: B8AA-012317

Lab ID#: 1701428C-15A

EPA METHOD TO-15 GC/MS

File Name:	**j020719**	**Date of Collection: 1/23/17 9:20:00 AM**	
Dil. Factor:	**1.46**	**Date of Analysis: 2/7/17 09:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	73	Not Detected	96	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: B8SS-2-012417

Lab ID#: 1701428C-16A

EPA METHOD TO-15 GC/MS

File Name:	**j020722**	**Date of Collection: 1/24/17 3:35:00 PM**	
Dil. Factor:	**2.48**	**Date of Analysis: 2/7/17 10:20 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	120	Not Detected	160	Not Detected

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	157 Q	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: B8SS-2D-012417

Lab ID#: 1701428C-17A

EPA METHOD TO-15 GC/MS

File Name:	**j020723**	**Date of Collection: 1/24/17 3:35:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/7/17 10:43 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	120	Not Detected	160	Not Detected

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	157 Q	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: B18SS-1-012617

Lab ID#: 1701428C-18A

EPA METHOD TO-15 GC/MS

File Name:	**j020720**	**Date of Collection: 1/26/17 5:30:00 PM**	
Dil. Factor:	**2.50**	**Date of Analysis: 2/7/17 09:33 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	120	150	160	190

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: B18SS-1Dup-012617

Lab ID#: 1701428C-19A

EPA METHOD TO-15 GC/MS

File Name:	**j020721**	**Date of Collection: 1/26/17 5:30:00 PM**	
Dil. Factor:	**2.46**	**Date of Analysis: 2/7/17 09:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methanol	120	180	160	230

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	104	70-130

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Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager Terry Taylor
Collected by: (Print and Sign) RO, TT, DL, RNO
Company AMAI Email TTaylor@Amicaconsult.com
Address 2700 Westchester Ave. City Purchase State NY Zip 10577
Phone 914-251-0400 x309 Fax 914-251-1286

Project Info:
P.O. #
Project # BMS VI
Project Name BMS VI

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	B301A-1-012117	2523G	01/21/17	1817	TO-15, MeOH, CH_4	30"	5"		
02A	B301A-2-012117	N1755	01/21/17	1820	TO-15, MeOH, CH_4	30"	6.5		
03A	B301A-3-012117	9551	01/21/17	1821	TO-15, MeOH, CH_4	28"	10.5"		
04A	B301A-4-012117	00895	01/21/17	1822	TO-15, MeOH, CH_4	30"	5"		
05A	B301A-4D-012117 00898	00898	01/21/17	1822	TO-15, MeOH, CH_4	30"	6"		
06A	B301A-5-012117	33787	01/21/17	1825	TO-15, MeOH, CH_4	30"+	6"		
07A	B1830AA-012117	33585	1/21/17	1842	TO-15, MeOH, CH_4	30"	6"		
08A	B181A-1-012117	N1735	1/21/17	1807	TO-15, MeOH, CH_4	30"+	8"		
09A	B181A-1D-012117	00138	1/21/17	1807	TO-15, MeOH, CH_4	30"	7.5"		
10A	B181A-2-012117	GL1216	1/21/17	1800	TO-15, MeOH, CH_4	30"+	5"		

Relinquished by: (signature) Date/Time: 1-27-17 1400
Received by: (signature) Date/Time: Fed EX Track No. 7782 9053 0772
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time: 1/30/17 0920
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:

Notes: Tag for canister 00898 indicated it is N0448. That ID is not on the packing slip. The canister has the serial # 00898, and is listed on the packing slip

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex		N/A	good	Yes No (None)	1701428

Form 1293 rev.11

Air Toxics LTD.

Chain-of-Custody Record

Contact Person Terry Taylor
Company Anderson Mulholland & Associates, Inc.
Address 2700 Winchester, Suite 417 City Purchase State NY Zip 10577
Phone 914-251-0400, x 309 FAX
Collected By: (Signature)

Project Information:
P.O. #
Project #
Project Name BMS VI Invest.
Buildings 8,13, 5, 18, and 30

Turn Around Time:
[X] Normal
[ ] Rush
Specify

Pressurized by:
Date:
Press. Gas: N2 He

Lab I.D.	Field Sample I.D.	Canister I.D.	Date & Time	Analysis Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
11A	B18IA-3-012117	34320	1/21/17:1810	TO-15, MeOH, CH_4	29 "Hg	6		
12A	B18IA-4-012117	N1591	1/21/17:1612	TO-15, MeOH, CH_4	29.5 "Hg	6		
13A	B8IA-2-012317	N1726	1/23/17:1223	TO-15, MeOH, CH_4	29 "Hg	8		
14A	B8IA-2D-012317	N0416	1/23/17:1223	TO-15, MeOH, CH_4	29 "Hg	9		
15A	B8AA-012317	00316	1/23/17:0920	TO-15, MeOH, CH_4	29 "Hg	3		
16A	B8SS-2-012417	1L1603	1/24/17:1535	TO-15, MeOH, CH_4	30 "Hg	5		
17A	B8SS-2D-012417	12373	1/24/17:1535	TO-15, MeOH, CH_4	29 "Hg	5		
18A	B18SS-1-012617	1L1720	1/26/17:1730	TO-15, MeOH, CH_4	30 "Hg	5		
~~19A~~	~~B18SS-1DUP-012617~~				"Hg			
20A	B18SS-1DUP-012617	N1939	1/26/17:1730	TO-15, MeOH, CH_4	30 "Hg	6		

NV 1/30/17 19A

Relinquished By: (Signature) Date/Time 1-27-17
Received By: (Signature) Date/Time 1400 Fed EX
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time 1/28/17 0920
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time

Notes:
FedEx Tracking No. 7782 9053 0772

Shipper Name	Air Bill #	Opened By	Temp ©	Condition	Custody Seals	Work Order #
Fed Ex		EAFL	N/A	Good	Yes No (None)	1701428

EXECUTIVE NARRATIVE

SDG No:	**1701428C**	Laboratory:	**Eurofins, Folson, CA**
Analysis:	**TO-15**	Number of Samples:	**19**
Location:			

SUMMARY: Nineteen (19) samples were analyzed for methanol in ambient air following Compendium Method TO-15. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues:	**None**
Major:	**None**
Minor:	**None**

Critical findings:	**None**
Major findings:	**None**
Minor findings:	**1.** Surrogate recoveries within laboratory control limits except for the cases described in the Data Review Worksheet. No action taken, professional judgment. Methanol was not detected in affected samples and surrogate recoveries were high.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature:
Date: March 18, 2017

METHANOL DATA SAMPLE SUMMARY

METHOD: TO-15

		METHANOL- TO - 15					
Sample ID	Date	Results	Units	Dilution Factor	Lab Flag	Validation	Reportable
1701428C-01A	1/21/2017	100	ug/m^3	1.61	-	U	Yes
1701428C-02A	1/21/2017	110	ug/m^3	1.64	-	U	Yes
1701428C-03A	1/21/2017	120	ug/m^3	1.91	-	U	Yes
1701428C-04A	1/21/2017	100	ug/m^3	1.61	-	U	Yes
1701428C-05A	1/21/2017	110	ug/m^3	1.68	-	U	Yes
1701428C-06A	1/21/2017	110	ug/m^3	1.64	-	U	Yes
1701428C-07A	1/21/2017	110	ug/m^3	1.64	-	U	Yes
1701428C-08A	1/21/2017	120	ug/m^3	1.79	-	U	Yes
1701428C-09A	1/21/2017	110	ug/m^3	1.68	-	U	Yes
1701428C-10A	1/21/2017	110	ug/m^3	1.75	-	U	Yes
1701428C-11A	1/21/2017	100	ug/m^3	1.58	-	U	Yes
1701428C-12A	1/21/2017	92	ug/m^3	1.41	-	U	Yes
1701428C-13A	1/23/2017	110	ug/m^3	1.75	-	U	Yes
1701428C-14A	1/23/2017	120	ug/m^3	1.87	-	U	Yes
1701428C-15A	1/23/2017	96	ug/m^3	1.46	-	U	Yes
1701428C-16A	1/24/2017	160	ug/m^3	2.49	-	U	Yes
1701428C-17A	1/24/2017	160	ug/m^3	2.42	-	U	Yes
1701428C-18A	1/26/2017	190	ug/m^3	2.50	-	-	Yes
1701428C-19A	1/26/2017	230	ug/m^3	2.46	-	-	Yes

Project Number:__1701428C___
Date:__01/21-23-24-26/2017___

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999"; USEPA Hazardous Waste Support Branch. Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #6. June, 2014). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Eurofins_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __1701428C_____ Sample matrix: ___Air_____
No. of Samples: _____19_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_1701428C-04A/1701428C-05A;_1701428C-08A/1701428C-09A_____
_____1701428C-13A/1701428C-14A;_1701428C-16A/1701428C-17A_____
_____1701428C-18A/1701428C-19A_____

___X___ Data Completeness	___X___ Laboratory Control Spikes
___X___ Sampling Integrity/Preservation	___X___ Field Duplicates
___X___ GC/MS Tuning	___X___ Calibrations
___X___ Internal Standard Performance	___X___ Compound Identifications
___X___ Blanks	___X___ Compound Quantitation
___X___ Surrogate Recoveries	___X___ Quantitation Limits

Overall Comments:_____VOCs_(methanol)_by_method_TO-15_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____ Rafael DeFaut _____
Date:__ _____03/18/17_____

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X___
Criteria were not met
and/or see below _____

SAMPLE INTEGRITY AND PRESERVATION

Canister used for sampling of the ambient air must be demonstrated clean, and leak free prior to sample collection. Cleanliness is demonstrated by the analysis of an individual canister or analysis of a representative canister, if only batch cleaning was required. Leak proof testing is performed on individual canisters. Canisters are used in conjunction with gauges, valves and flow controllers. Therefore, canister should be demonstrated clean and leak free inclusive of these components as appropriate.

a. Leak proof test:
Was the pressure of each canister measured before shipping? **Yes** or No
Was the pressure of each canister measured before sampling? **Yes** or No
Did the canister hold vacuum/pressure within +/- 2 psi from the date shipped to the sampling date? **Yes** or No

Note:

1. The laboratory should be notified if the difference between the laboratory and field pressure is greater than 2 psi.

Actions:

Actions for use of canisters with failing leak test criteria are indicated in Table 1 below.

Table 1. Canister Leak test Actions for TO-15 Analysis*

Matrix	Difference in initial and 24 hour pressure (psi) Criteria	Action	
		Detected Associated Compounds	Non-Detected Associated Compounds
Air	≤ 5	No qualification	
Air	> 5	J	UJ or R

*Excessive time period (> 3months) elapsed between leak test and actual use should be considered in evaluation of canister integrity.

b. Cleanliness

Integrity of the canister used for sampling of air for analysis should be maintained at all times including time of shipment to the field, sampling, shipping back to the laboratory and time of analysis. Analytical results of canister cleaning verification must be taken into account in the validation of sample results.

Does the canister meet the cleanliness criteria? **Yes** or No

Is the canister verification included in the data package? Yes or **No**

Actions:

Canister contamination actions are stated in Table 2 below.

Note: Laboratory stated that the SUMMA canisters employed were 100 % certified.

Table 2. Canister Contamination Actions for TO-15 Analyses

Contamination Type/level	Canister Cleaning Result	Sample Result	Action for Samples
Clean Canister analysis	Detects	Analytes found in clean canister analysis are non-detects	No qualification required
	<CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < 2x the CRQL	Report concentration of sample with a U
		≥ 2x the CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ clean canister value	Report clean canister value with a U
		≥ CRQL and > clean canister value	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required

c. Holding time and sample integrity

SUMMA canisters are to minimize sample charges or loss for majority of the analyte. Sample integrity is maintained by ensuring the system is closed tight and canister pressure from the time of sampling to the time of analysis is maintained within a difference allowable due to temperature change.

Was the canister pressure measured at the conclusion of the sampling period? **Yes** or No

Was the canister pressure measured upon arrival to the laboratory? **Yes** or No

Was the canister pressure difference between sampling and analysis less than 5 psi? **Yes** or No

Actions:

Qualify sample results using technical holding time information as stated in Table 3.

Pressure difference between sampling and analysis should be less than 5 psi. Qualify samples as per Table 3 requirements.

Table 3. Holding Time Actions for TO-15 Volatile Analyses

Matrix	Preserved (Pressure difference between sampling and analysis ≤ 5psi)	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Air	Yes	< 30 days	No qualification	
	Yes	>30 days	J	UJ
Air	No	< 30 days	J	UJ
	No	>30 days	J	R

Complete table for all samples and note the integrity and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	Pressure difference < 5 psi	ACTION
All samples analyzed within the recommended method holding time. All summa canisters received in good conditions. Pressure difference < 5 psi between sampling and analysis.				

<u>The following pressure conversion is used, if necessary</u>

PRESSURE CONVERSION TABLE								
PSI	ATM	kgf/cm²	in.H_2O	mmHg	in.Hg	Kpa	Bar	mm H_2O
1	0.068046	0.070307	27.7276	51.715	2.03602	6.895	0.6895	704.28104
14.696	1	1.0332	407.484	760	29.921	101.325	1.01325	10350.0936
14.2233	0.96784	1	394.38	735.559	28.959	98.096	0.98067	10000
0.036092	0.002454	0.00253	1	1.8651	0.07343	0.249	0.00249	25.4
0.019336	0.001315	0.001359	0.53616	1	0.03937	0.1333	0.001333	13.618464
0.491154	0.0033421	0.03453	13.6185	25.4	1	3.3864	0.033864	345.9099
0.145	0.00987	0.010197	4.0186	7.5006	0.2953	1	0.01	102.07244
14.5038	0.98692	1.01972	402.156	750.062	29.53	100	1	10214.7624

All criteria were met __X___
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

Gas Chromatograph/Mass Spectrometer (GC/MS) Instrument Performance Check

Action:

NOTES: This requirement does not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.
All mass spectrometer instrument conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortions for the sole purpose of meeting the method specifications are contrary to the Quality Assurance (QA) objectives, and are therefore unacceptable.

NOTES: No data should be qualified based on BFB or DFTTP failure. Instances of this should be noted in the narrative.
All ion abundance ratios must be normalized to m/z 95, the nominal base peak, even though the ion abundance of m/z 174 may be up to 120% that of m/z 95.

1. If samples are analyzed without a preceding valid instrument performance check, qualify all data in those samples as unusable (R).
2. If the laboratory has made minor transcription errors which do not significantly affect the data, the data reviewer should make the necessary corrections on a copy of the form.
3. If the laboratory has failed to provide the correct forms or has made significant transcription or calculation errors, the Region's designated representative should contact the laboratory and request corrected data. If the information is not available, the reviewer must use professional judgment to assess the data and notify the Project Officer (PO).
4. If ion abundance criteria are not met, professional judgment may be applied to determine to what extent the data may be utilized. When applying professional judgment to this topic, the most important factors to consider are the empirical results that are relatively insensitive to location on the chromatographic profile and the type of instrumentation. Therefore, the critical ion abundance criteria for BFB are the m/z 95/96, 174/175, 174/176, and 176/177 ratios. The relative abundances of m/z 50 and 75 are of lower importance. This issue is more critical for Tentatively Identified Compounds (TICs) than for target analytes.
5. Note, in the Data Review Narrative, decisions to use analytical data associated with BFB instrument performance check failures (not meeting contract requirements).
6. If the reviewer has reason to believe that instrument performance check criteria were achieved using techniques other than those described in the Compendium method TO-15 entitled "Determination Of Volatile Organic Compounds(VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry(GC/MS)", section 10.4, obtain additional information on the instrument performance checks. If the techniques employed are found to be at variance with the contract requirements, the performance and procedures of the laboratory may merit evaluation.
7. Use professional judgment to determine whether associated data should be qualified based on the spectrum of the mass calibration compound.

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 24 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X___
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____02/07/2017_____
Date of initial calibration verification:_____-_____
Dates of continuing calibration:_____02/07/2017_____
Instrument ID numbers:_____MSD-J_____
Matrix/Level:_____Air/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibrations meet method specific requirements. Initial calibration retention times meet method specific requirements. One point calibration curve performed.				

Note:

The following criteria apply:

Table 5. Initial Calibration Actions for TO-15 Analyses

Criteria for TO-15 Analysis	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RRF < 0.010 (poor response volatile target compounds, Table 4) RRF < 0.050 (all other volatile target compounds)	J (based on mass spectral identification)	R
RRF > 0.010 (poor response volatile target compounds, Table 4) RRF > 0.050 (all other volatile target compounds)	No qualification	
% RSD > 40.0 or < -40.0 (poor response volatile target compounds, Table 4) % RSD > 30.0 or < -30.0 (all other Volatile target compounds)	No qualification	
% RSD < 40.0 and > -40.0 (poor response volatile target compounds, Table 4) % RSD < 30.0 and > -30.0 (all other volatile target compounds)	J	Use professional judgment

Table 6. Continuing Calibration Verification (CCV) Actions for TO-15 Analyses

Criteria for CCV	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RRF < 0.010 (poor response volatile target compounds, Table 4) RRF < 0.050 (all other volatile target compounds)	J (based on mass spectral identification)	R
RRF > 0.010 (poor response volatile target compounds, Table 4) RRF > 0.050 (all other volatile target compounds)	No qualification	
%D > 40.0 or < -40.0 (poor response volatile target compounds, Table 4) %D > 30.0 or < -30.0 (all other Volatile target compounds)	J	UJ
%D < 40.0 and > -40.0 (poor response volatile target compounds, Table 4) %D < 30.0 and > -30.0 (all other volatile target compounds)	No qualification	

If the % D for daily calibration exceeds -90, use professional judgment to see if non-detects nee to be qualified as unusable "R"

Note: Methanol is not a poor response compound; the regular calibration/calibration verification criteria are employed.

A separate worksheet should be filled for each initial curve

Table 4. TO 15 Volatile Compounds List*

Compound	**CAS Number**	**Synonyms**
Acetone	67-64-1	Dimethyl ketone; Dimethylformaldehyde; 2-Propanone
Allyl chloride	107-05-1	3-Chloropropene; 3-Chloroprene
Benzene	71-43-2	Benzol; Benzine
Benzyl chloride	100-44-7	Chloromethylbenzene; alpha-Chlorotoluene
Bromodichloromethane	75-27-4	Monobromodichloromethane; Methane-bromodichloro
Bromoethene	593-60-2	Vinyl bromide; Monobromoethene
Bromoform	75-25-2	Tribromoethane
Bromomethane	74-83-9	Methyl bromide; Monobromomethane
1,3-Butadiene	106-99-0	Biethylene; Erythrene; Pyrrolyene
Carbon disulfide	***75-15-0***	***Carbon bisulfide; Carbon sulfide***
Carbon tetrachloride	56-23-5	Carbon tet; Tetrachloromethane
Chlorobenzene	108-90-7	Monochlorobenzene; Chlorobenzol; Benzene chloride
Chloroethane	***75-00-3***	***Ethyl chloride; Chlorene; Chloryl***
Chloroethene	75-01-4	Vinyl chloride; Ethylene monochloride
Chloroform	67-66-3	Trichloromethane; Methyltrichloride; Methane trichloride
Chloromethane	***74-87-3***	***R40; Methyl chloride; Monochloromethane***
Cyclohexane	110-82-7	Hexamethylene; Hexahydrobenzene; Hexanaphthene
Dibromochloromethane	124-48-1	Chlorodibromomethane
1,2-Dibromoethane	***106-93-4***	***EDB; Ethylene dibromide***
1,2-Dichlorobenzene	95-50-1	ODB; Chloroben
1,3-Dichlorobenzene	541-73-1	meta-Dichlorobenzene; m-Phenylenedichloride
1,4-Dichlorobenzene	106-46-7	para-Dichlorobenzene; Parazene; Santochlor
1,1-Dichloroethane	75-34-3	Ethylidene chloride; Ethylidene dichloride
1,2-Dichloroethane	107-06-2	Ethylene dichloride; Glycol dichloride; 1,2-DCA
1,1-Dichloroethene	75-35-4	1,1-DCE; Vinylidene chloride
cis-1,2-Dichloroethylene	156-59-2	cis-1,2-DCE; cis-Acetylene dichloride
trans-1,2-Dichloroethylene	156-60-5	trans-1,2-DCE; trans-Acetylene dichloride
1,2-Dichloropropane	***78-87-5***	***Propylene dichloride; Propylene chloride***
cis-1,3-Dichloropropene	10061-01-5	1-Propene,1,3-dichloro-,(z)-; cis-1,3-Dichloro-1-Propene
trans-1,3-Dichloropropene	10061-02-6	trans-1,3-Dichloro-1-Propene; trans-1,3-Dichloropropylene
1,4-Dioxane	***123-91-1***	***Diethylene dioxide; Diethylene ether***
Ethyl acetate	141-78-6	Acetic acid ethyl ester; Acetic ether
Ethylbenzene	100-41-4	Ethylbenzol; Phenylethane
4-Ethyltoluene	622-96-8	1-Ethyl-4-methyl benzene; p-Methylethylbenzene
Freon 11 (CCl3F)	75-69-4	Trichlorofluoromethane; Fluorotrichloromethane; Fluorocarbon 11

Freon 12 (CCl2F2)	75-71-8	Dichlorodifluoromethane; Fluorocarbon 12
Freon 113 (C2Cl3F3)	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane; Fluorocarbon 113; 1,1,2-Trichlorotrifluoroethane
Freon 114 (C2Cl2F4)	76-14-2	1,2-Dichlorotetrafluoroethane; Halocarbon 114; 1,2-Dichloro-1,1,2,2-tetrafluoroethane
Heptane	142-82-5	Dipropylmethane; Heptyl hydride
Hexachlorobutadiene	87-68-3	1,3-Hexachlorobutadiene; Perchlorobutadiene
Hexane	110-54-3	n-Hexane; Hexyl hydride
2-Hexanone	591-78-6	Methyl butyl ketone; Butyl methyl ketone; Hexan-2-one
Isopropyl alcohol	67-63-0	2-Propanol; Isopropanol
Methylene chloride	***75-09-2***	***Dichloromethane; Methylene dichloride***
Methyl ethyl ketone	***78-93-3***	***MEK; 2-Butanone; Ethyl methyl ketone***
Methyl isobutyl ketone	108-10-1	MIBK; 2-Pentanone; Hexone; Isopropylacetone
Methyl tert-butyl ether	1634-04-4	MTBE; 2-Methoxy-2-methylpropane; tert-Butyl methyl ether
Propylene	115-07-1	Propene; Methylethylene
Styrene	100-42-5	Vinylbenzene; Phenylethylene
1,1,2,2-Tetrachloroethane	79-34-5	Tetrachloroethane; Acetylene tetrachloride; Bonoform
Tetrachloroethene	127-18-4	PCE; PERC; Perchloroethylene; Ethylene tetrachloride; Carbon bichloride; Carbon dichloride
Tetrahydrofuran	109-99-9	Diethylene oxide; Butylene oxide
Toluene	108-88-3	Toluol; Methylbenzene
1,2,4-Trichlorobenzene	120-82-1	1,2,4-Trichlorobenzol
1,1,1-Trichloroethane	71-55-6	Methyl chloroform; Trichloroethane
1,1,2-Trichloroethane	79-00-5	beta-Trichloroethane; Ethane trichloride; Vinyl trichloride
Trichloroethene	79-01-6	TCE; Acetylene trichloride; Ethinyl trichloride
1,2,4-Trimethylbenzene	95-63-6	Pseudocumene; Pseudocumol
1,3,5-Trimethylbenzene	108-67-8	Mesitylene; Trimethylbenzol
2,2,4-Trimethylpentane	540-84-1	Iso-octane; Isobutyltrimethylmethane
Vinyl acetate	108-05-4	Acetic acid ethenyl ether; Ethenyl acetate
p-Xylene	106-42-3	p-Methyltoluene; 1,4-dimethylbenzene
m-Xylene	108-38-3	m-Methyltoluene; 1,3-dimethylbenzene
o-Xylene	95-47-6	o-Methyltoluene; 1,2-Dimethylbenzene

*Laboratories use different sets and subsets of analytes on as needed basis.

NOTES:

Compounds in bold italicized letters may have poor GCMS response. These poor response compounds are evaluated using more relaxed relative response factor criteria as stated below.

All criteria were met __X___
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Blanks criteria and appropriate actions

Table 7. Blank Actions for TO-15 Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument***	Detects	Not detected	No qualification required
	< CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL* and < 2x the CRQL**	Report concentration of sample with a "U"
		≥ 2x the CRQL**	No qualification required
	> CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL* and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL* and > blank concentration	No qualification required
	= CRQL*	≤ CRQL*	Report CRQL value with a U
		> CRQL*	No qualification required
	Gross contamination **	Detects	Report blank value for sample concentration with a U

* 2x the CRQL for methylene chloride, 2-butanone and acetone.
** 4x the CRQL for methylene chloride, 2-butanone, and acetone.
*** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 µg/L.

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_All_method_blank_meet_method_specific_criteria._____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Note:

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_field/trip/equipment_blanks_analyzed_with_this_data_package._

Field/trip blank actions

Field or Trip blank when available should be assessed for possible contaminants in the canister used for trip blank. This canister and its analytical results are specific to the trip blank sample **only**. If contaminants are present in the canister used for trip blank, its suitability for use as trip blank can be assessed using the following criteria.

Table 8. Field/Trip Blank suitability based on Canister contamination

Clean canister Result	Field/Trip Blank Result	Action for Field/Trip Blank
Detects	Not detected	No qualification, no action for samples is required
Detects	< clean canister result or ≥ clean canister result but < 2X the clean canister result	Report as non-detect "U", invalid as trip blank, no action for samples is required.
	≥ 2x the clean canister result	No qualification, valid trip blank for sample actions.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met _____
Criteria were not met
and/or see below ___X___

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	**SURROGATE COMPOUND**			**ACTION**
	1,2-DICHLOROETHANE-d4	**Toluene-d8**	**4-BFB**	
_Surrogate_recoveries_within_laboratory_control_limits_except_for_the_cases_described_in_____this_document._____				
_1701428C-16A_____	_____157_____			_____No_action_
_1701428C-17A_____	_____157_____			_____No_action_
_____				
_____				

Note: No action taken, professional judgment. Methanol was not detected in affected samples.

QC Limits* (Air)

_____LL_to_UL___70__to_130__ _70__to_130_ _70__to_130__

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices. LCS concentration should be in the middle of the calibration range and under the same sample conditions.

1. LCS Recoveries Criteria

Table 9. LCS/LCSD Actions for TO-15 Analyses

Criteria	Action	
	Detected Associated Compounds	**Non-detected Associated Compounds**
Percent recovery Criteria		
%R > Upper Acceptance Limit (>130%)	J	No qualification
%R in the acceptable range, 70-130%	No qualification	
%R < Lower Acceptance Limit (< 70 %)	J	UJ
%R < 50%	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualification	
Relative Percent Difference Criteria		
% RPD ≤ 25%	No qualification	
% RPD > 25 %	J	UJ

LCS ID COMPOUND % R QC LIMIT

LCS/LCSD(Blank_spike)_analyzed_in_this_data_package._%_recoveries_and_RPD_____
_within_laboratory_control_limits._____
_____
_____
_____
_____
_____
_____

Note:

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? **Yes** or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ____X____
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs:	__1701428C-04A/1701428C-05A__	Matrix:_Air____
Sample IDs:	__1701428C-08A/1701428C-09A__	Matrix:_Air____
Sample IDs:	__1701428C-13A/1701428C-14A__	Matrix:_Air____
Sample IDs:	__1701428C-16A/1701428C-17A__	Matrix:_Air____
Sample IDs:	__1701428C-16A/1701428C-17A__	Matrix:_Air____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. In the absence of QAPP guidance for validated data from field duplicates, the following action will be taken.

Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the vales for each compound. Note large RPDs (>50 %) in the narrative. Use professional judgment to qualify data when RPD > 50 %.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Laboratory/field duplicate analyzed with this data package. RPD within laboratory and method performance criteria for target analytes.					

Other suggested actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +40% or -40% of the IS area in the associated calibration standard (CCV standard or mid-point from initial calibration).
* Retention time (RT) within ± 20 seconds of the IS area in the associated calibration standard.

Table 10. Internal Standard Actions for TO-15 Analyses

Criteria	Action	
	Detected Associated Compounds*	Non-detected Associated Compounds*
Area counts > 140% of CCV or mid-point standard from initial calibration)	J-	No qualification
Area counts < 60% of CCV or mid-point standard from initial calibration)	J+	R
Area counts ≥ 60% but ≤ 140% of CCV or mid-point standard from initial calibration)	No qualification	
RT difference > 20.0 seconds between samples CCV or mid-point standard from initial calibration)	R*	
RT difference < 20.0 seconds between samples and CCV or mid-point standard from initial calibration)	No qualification	

* Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

_Internal_standard_area_and_retention_times_within_laboratory_control_limits_for_both_samples_and_calibration_standards_____

All criteria were met __X___
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

1701428C-19A

Methanol RF = 3.11985

[ ] = (68183)(400)/(121388)(3.11985)

= 72.02 ppbv OK

All criteria were met __X___
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASONS FOR DILUTION
Samples diluted by a factor of 2.5 or less.		

System Performance

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Note, for Laboratory Project Officer (PO) action, any degradation of system performance which significantly affected the data.

Note:

Overall Assessment of Data

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Note, for Laboratory Project Officer (PO) action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Overall assessment of the data: Results are valid; the data can be used for decision making purposes.